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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/571,606	MEIRICK ET AL.
	Examiner	**Art Unit**
	MAHENDRA PATEL	2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

This communication is in response to the Amendment filed on 11/02/2010.
Application No: 10/571,606.

Claims 1-29 are pending.

The amendments for compliance with 35 USC 112 has been considered and the examiner withdraws previous rejection under these paragraphs.

Response to Arguments

1. An examiner's Response to the record appears below.

2. Applicant's arguments with respect to claims 1-29 have been considered but they are not persuasive and, therefore, the claim rejection is maintained. Please see explanation below, which addresses the arguments.

3. Applicant argues that (a) Yoshida's discloses packet control function in node 206 is separate from the base station (Fig. 1).

(b) Yoshida fails to disclose segmenting data packets into data packet segments.

(c) Muller (and also Jason) is directed towards a wired computer system network therefore not in the same field of endeavor.

(d) Muller et al. does not disclose that a size of a data packet segment is compared with a size of a next consecutive data packet segment in the buffer. Rather, Muller et al. consistently states that the size of each data packet segment is compared to the same MTU threshold (column 41, lines 60-64; column 42, lines 5-11). Accordingly, there is therefore no teaching in Muller et al. that the respective sizes of consecutive data packet segments in the buffer are compared to each other.

(e) Jason fails to teach a base station buffer discarding an identified complete data package as recited in claim 1.

(f) Muller also teaches discarding packets.

4. However, (a) Yoshida discloses a small data buffer in a base station (See Fig. 1) and **communication link** to node 206. Therefore node 206 is a part of the base station system as mentioned in the claim 1.

(b) Muller teaches segmenting [Col 35, lines 47-55], e.g. virtually any form of data structure may be employed (e.g., database, table, queue, list, array), either monolithic or **segmented**, and may be implemented in hardware or software).

(c) In response to applicant's argument that Muller (and also Jason) is directed towards a wired computer system network therefore not in the same field of endeavor, is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, teaching of the wired network would have been obvious to one of ordinary skill in the art at the time of the invention, and would have been implemented in the wireless network because of the old to new technology changes market forces.

(d) In addition to the MTU threshold comparison, Muller also teaches a data packet segment is compared with a size of a next consecutive data packet segment in the buffer (Col 41, lines 65-67, Col 42, lines 01-02], e.g. one manner of identifying the final portion of data in a flow's datagram is to **examine the size of each packet** and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 41, lines 49-64] The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is **usually equal or nearly**

equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU). Since each packet except last one is equal to the max size of the MTU, and they are compared with MTU, and MTU is a buffer, therefore Muller teaches "packet segment is compared with a size of a next consecutive data packet segment in the buffer".

(e) Jason teaches both fragmented [0004] as well as completed package discarding [0005] (e.g. because the "don't fragment" bit is set, if the packet is larger than the MTU of the path, it will not be fragmented. Instead, an error message will be sent back to the sending point (e.g. packet is not send to the receiving point, hence packet is discarded) if that packet otherwise would have been fragmented (steps 306-308)).

(f) Muller as well as Jason both teaches discarding packets. However, Muller teaches randomly discarding packets from the buffer, while Jason teaches identified packet discarding based on size with respect to the to the MTU. One of ordinary skill in the art at the time of the invention, and would use Jason for simple substitution of one known element for another to obtain predictable result.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the method of Jason and Muller within the method of Yoshida to provide improve buffer management in a radio communication system. Applicant's arguments are not persuasive and, therefore, the claims (1-29) rejection is maintained.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-29 are** rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (US 20020068588 A1) in view of Muller et al. (US 6480489 B1), and further in view of Jason et al. (US 20030076850 A1).

Regarding claim 1, Yoshida teaches a method of managing a data buffer comprising a queue of consecutive data packets in a base station system of a mobile communications system ([0014] (e.g. A buffer for temporarily storing (i.e. queuing) packets received from the packet transfer apparatus [0015] a packet transfer apparatus connected between the base stations and a communication network)), comprising the step of:

Yoshida differ from the claimed invention in not specifically teaching said base station system comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer.

However, in the same field of endeavor, Muller teaches a method for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer ([Col 42, lines 5-10] (e.g. Header parser 106 in one embodiment of the invention is configured to **compare the size of each packet's data portion** (I.e. comparing a size of a data packet segment with a size of a next consecutive data packet segment) to a pre-selected value. [Col 35, lines 47-55], e.g. virtually any form of data structure may be employed (e.g., database, table, queue, list, array), either monolithic or **segmented**, and may be implemented in hardware or software)).

Muller further teaches Said base station system identifying a complete data packet in said buffer based on said comparison ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Yoshida and Muller differ from the claimed invention in not specifically teaching said base station system discarding said identified complete data from the said buffer.

However, in the same field of endeavor, Jason teaches a method for discarding said identified complete data from the said buffer ([0004] (e.g. until the reassembly timer for the datagram has expired and the fragments are discarded. [0005] (e.g. because the "don't fragment" bit is set, if the packet is larger than the MTU of the path, it will not be fragmented. Instead, an

error message will be sent back to the sending point (e.g. packet is not send to the receiving point, hence packet is discarded) if that packet otherwise would have been fragmented (steps 306-308)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the method of Jason and Muller within the method of Yoshida to provide improve buffer management in a radio communication system. The combined method provides efficiently retransmitting a packet, specifically, an automatic repeat request (ARQ) method for providing efficient buffer management and efficient scheduling, and hence provides better networking performance.

Regarding claim 2, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 1. Muller further teaches the method wherein said identifying step comprises the steps of:

identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment is smaller than said size of said next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU (i.e. following last segment, the next data packet segment is identified as a first data packet segment). ([Col 41, lines 65-68] (e.g. Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Jason further teaches associating said identified first data packet segment with a first segment identifier ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (i.e. associating said identified first data packet segment))).

Regarding claim 3, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 1. Muller further teaches the method wherein said identifying step comprises the steps of:

identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment differs from said size of said next data packet segment ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data (i.e. a last data packet segment) in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Jason further teaches associating said identified last data packet segment with a last segment identifier ([0021] (e.g. The data classification module 64 analyzes the header encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. identified last data packet segment) of a packet)).

Regarding claim 4, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 2. Jason further teaches the method wherein said discarding step comprises the step of discarding said data packet segment associated with said first segment

identifier, said data packet segment associated with said last segment identifier and any intermediate data packet segments between said data packet segment associated with said first segment identifier and said data packet segment associated with said last segment identifier in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all of the fragments 29 of the packet have been received or until the reassembly timer for the datagram has expired and the fragments are discarded. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet segments) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier) of a packet)).

Regarding claim 5, this is a system claim which is analogous to the method claim 1. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 6, this is a system claim which is analogous to the method claim 2. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 2 apply.

Regarding claim 7, this is a system claim which is analogous to the method claim 3. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an

example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 3 apply.

Regarding claim 8, this is a system claim which is analogous to the method claim 4. Yoshida further teaches electronic circuitry ([0035] (e.g. FIG. 19 is a block diagram showing an example of the hardware configuration of a base station)). Therefore the same rejections and citations of claim 4 apply.

Regarding claim 9, this is a network node system claim which is analogous to the method claim 1. Yoshida further teaches a network node ([0008] (e.g. On the other hand, by providing a buffer at a node separate from the base stations, the packet dropout can be prevented)).

Jason further teaches a data buffer comprising a queue of consecutive segments of data packets ([0022] (e.g. The data packets are then queued and scheduled for sending according to a policy, using a queuing and scheduling module)).

Yoshida further teaches a system for managing said data buffer ([0085] (e.g. a packet management table 1107 holds a list of packets stored in the buffer 1103)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 10, this is a method claim which is analogous to the method claim 1. Muller further teaches a method for enabling identification of a complete data packet in a data buffer ([Col 42, lines 13-16] (e.g. Thus, in state 620, flow database manager 108 determines whether the received packet appears to carry the final portion of data (I.e. identification of a complete data packet) for the flow's datagram)). Therefore the same rejections and citations of claim 1 apply.

Regarding claim 11, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 10. Muller further teaches the method further comprising the step of providing a segment counter associated with a data packet segment in said buffer ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow. The next packet received as part of the same (or a new) flow causes the counter to be incremented to two, which value is stored in the flow activity indicator for the associated flow. In this example, no two flows should have the same flow activity indicator except at initialization, when they may all equal zero or some other predetermined value)).

Regarding claim 12, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of:

comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter is smaller than said size of said next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last

packet will hold the remainder, usually causing it to be smaller than the MTU. ([Col 41, lines 65-68] Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 13, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 12. Muller further teaches the method further comprising the steps of:

(a) comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches (b) associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to or larger than said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-

35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches repeating both said comparison step (a) and said associating step (b) until said size of the data packet currently associated with said counter is smaller than said size of said next data packet segment, whereby said next data packet segment is identified as a first data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU (i.e. following last segment, the next data packet segment is identified as a first data packet segment))).

Regarding claim 14, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 12. Muller further teaches the method further comprising the step of associating said segment counter with said first data packet segment of said complete data packet ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow)).

Regarding claim 15, Yoshida in view of Muller and further in view of Jason teaches all he limitations of clam 14. Muller further teaches the method further comprising the steps of:

comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data (i.e. a last data packet segment) in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 16, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 15. Jason further teaches the method wherein said complete data packet is identified as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier).

These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 17, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 15. Muller further teaches the method further comprising the steps of:

determining a total size of said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram)).

Muller further teaches comparing said total size with a minimum size threshold ([Col 43, lines 65-68] (e.g. this determination may be made on the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Jason further teaches identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data

packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Muller further teaches if said total size is larger than said minimum size threshold ([Col 43, lines 65-68] (e.g. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Regarding claim 18, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of: comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn)).

Muller further teaches identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment [Col 41, lines 60-64] (e.g. Thus, each packet except the last (i.e. last differs from said size of said next data packet) is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 19, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 11. Muller further teaches the method further comprising the steps of:

(c) comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches (d) associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each

packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches repeating both said comparison step (c) and said associating step (d) until said size of the data packet segment currently associated with said differs from said size of said next data packet segment, whereby said next data packet segment is identified as a last data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU)).

Regarding claim 20, Yoshida teaches a system for enabling identification of a complete data packet in a data buffer comprising a queue ([0014] (e.g. A buffer for temporarily storing (i.e. queuing) comprising:

Yoshida differ from the claimed invention in not specifically teaching of consecutive data packet segments.

However, in the same field of endeavor, Jason teaches a method for consecutive data packet segments ([0016] (e.g. If the packet is larger than the path MTU, the packet is fragmented

(I.e. segmented) as it is sent to the receiving interface device. After receiving the packets, the receiving interface device analyzes the fragments to determine their sizes)).

Yoshida and Jason differ from the claimed invention in not specifically teaching means for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer.

However, in the same field of endeavor, Muller teaches a method for comparing a size of a data packet segment with a size of a next consecutive data packet segment in said buffer ([Col 42, lines 5-10] (e.g. Header parser 106 in one embodiment of the invention is configured to compare the size of each packet's data portion (I.e. comparing a size of a data packet segment with a size of a next consecutive data packet segment) to a pre-selected value. [Col 35, lines 47-55], e.g. virtually any form of data structure may be employed (e.g., database, table, queue, list, array), either monolithic or **segmented**, and may be implemented in hardware or software)).

Muller further teaches means for identifying said complete data packet based on said comparison ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the method of Jason and Muller within the method of Yoshida to provide improve buffer management in a radio communication system. The combined method provides efficiently retransmitting a packet, specifically, an automatic repeat request (ARQ) method for

providing efficient buffer management and efficient scheduling, and hence provides better networking performance.

Regarding claim 21, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 20. Muller further teaches the system comprising means for associating a segment counter with a data packet segment in said buffer ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow. The next packet received as part of the same (or a new) flow causes the counter to be incremented to two, which value is stored in the flow activity indicator for the associated flow. In this example, no two flows should have the same flow activity indicator except at initialization, when they may all equal zero or some other predetermined value)).

Regarding claim 22, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said identifying means is adapted for identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter is smaller than said size of said

next data packet segment ([Col 41, lines 60-64] (e.g. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. The last packet will hold the remainder, usually causing it to be smaller than the MTU. ([Col 41, lines 65-68] Therefore, one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 23, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said associating means is adapted for associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to or larger than said size of said next data packet segment [Col 41, lines 60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is

usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches said comparison means is adapted for repeating said size comparison and said associating means is adapted for repeating said counter association until said size of the data packet segment currently associated with said counter is smaller than said size of said next data packet segment whereby said identifying means is adapted for identifying said next data packet segment as a first data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment will be smaller than the path MTU)).

Regarding claim 24, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 22. Muller further teaches the system wherein said associating means is adapted for associating said segment counter with said first data packet segment of said complete data packet ([Col 38, lines 32-42] (e.g. for the first packet received after NIC 100 is initialized, a flow activity counter may be incremented to the value of one. This value may then be stored in flow activity indicator 524 for the associated flow)).

Regarding claim 25, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 24. Jason further teaches the system wherein said comparison means is adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer , wherein said identifying means is adapted for identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 26, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 25. Jason further teaches the system wherein said identifying means is adapted for identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34

prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Regarding claim 27, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 25. Muller further teaches the system further comprising means for determining a total size of said first data packet segment of said complete data packet ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram)).

Jason further teaches said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer ([0004] (e.g. After creating the fragments, the router re-encapsulates the data such that each of the fragments 29 will have the tunneling outer header 34 prepended to the data 30, but only the first fragment 29a of the data packet will have the inner header (I.e. first segment identifier). These fragments 29 are cached at the receiving point 24 until all (i.e. complete data packet) of the fragments 29 of the packet have been received. [0021] the data classification module 64 analyzes the header (I.e. segment identifier of any intermediate

data packet) encapsulated with the data to determine whether the data is a packet or a fragment, and if it is a fragment, to determine whether it the last fragment (I.e. last segment identifier for complete data)) of a packet)).

Muller further teaches said comparison means is adapted for comparing said total size with a minimum size threshold ([Col 43, lines 65-68] (e.g. this determination may be made on the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Muller further teaches and said identifying means is adapted for identifying said complete data packet as comprising said first data packet segment of said complete data packet, said last data packet segment of said complete data packet and any intermediate data packet segments between said first and last data packet segment of said complete data packet in said buffer if said total size is larger than said minimum size threshold ([Col 42, lines 52-62] (e.g. The new flow sequence number is determined by adding the size of the newly received data to the existing flow sequence number. Depending upon the configuration of the packet (e.g., values in its headers), this sum may need to be adjusted. For example, this sum may indicate simply the total amount of data received thus far for the flow's datagram. ([Col 43, lines 65-68] (e.g. this determination may be made on the basis of control information received by the flow database manager from the header parser. If more data is expected (e.g., the amount of data in the packet equals or exceeds a threshold value)).

Regarding claim 28, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is

adapted for comparing a size of said data packet segment associated with said counter with a size of a next consecutive data packet segment in said buffer , wherein said identifying means is adapted for identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer if said size of said data packet segment associated with said counter differs from said size of said next data packet segment [Col 41, lines 60-64] (e.g. Thus, each packet except the last (i.e. last differs from said size of said next data packet) is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Regarding claim 29, Yoshida in view of Muller and further in view of Jason teaches all the limitations of clam 21. Muller further teaches the system wherein said comparison means is adapted for comparing a size of the data packet segment currently associated with said counter with a size of a next consecutive data packet segment in said buffer ([Col 41, lines 65-68] (e.g. one manner of identifying the final portion of data in a flow's datagram is to examine the size of each packet and compare it to a figure (e.g., MTU) that a packet is expected to exceed except when carrying the last data portion. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Muller further teaches wherein said associating means is adapted for associating said counter with said next data packet segment if said size of the data packet segment currently associated with said counter is equal to said size of said next data packet segment [Col 41, lines

60-64] (e.g. The typical manner of disseminating a datagram among multiple packets is to put as much data as possible into each packet. Thus, each packet except the last is usually equal or nearly equal in size to the maximum transfer unit (MTU) allowed for the network over which the packets are sent. [Col 37, lines 31-35] the flow activity indicator (i.e. flow counter) may be used to identify flows that are obsolete or that should be torn down for some other reason)).

Jason further teaches said comparison means is adapted for repeating said size comparison and said associating means is adapted for repeating said counter associating until said size of the data packet segment currently associated with said counter differs from said size of said next data packet segment , whereby said identifying means is adapted for identifying said next data packet segment as a last data packet segment of said complete data packet in said buffer ([0016] (e.g. After receiving the packets, the receiving interface device 40 analyzes the fragments to determine their sizes (616). If the fragment being analyzed is the last fragment in a packet (step 618), the size is checked to see if it is greater than the path MTU (as are non-fragmented datagrams). If so, the path MTU is changed. If it is not larger than the path MTU, then the path MTU is not changed as it most likely that the last fragment (I.e. last data packet segment of said complete data packet) will be smaller than the path MTU)).

Prior Art Record

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Bournas; Redha Mohammed et al. (US 5751970 A), Method for determining an optimal segmentation size for file transmission in a communications system.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahendra Patel whose telephone number is 571-270-7499. The examiner can normally be reached on 9:30 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http: //pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MAHENDRA PATEL/
Examiner, Art Unit 2617

/NICK CORSARO/
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